

Exponent®
Engineering & Scientific Consulting

Donald Parker

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Professional Profile

Based on an extended career in industry and consulting, Mr. Parker has attained a broad level of experience and expertise in mechanical and automotive design engineering, testing, and collision analysis and reconstruction. His wide range of knowledge and skills enable him to answer complex engineering questions and solve unique problems.

Mr. Parker specializes in automotive vehicle design issues, crashworthiness performance analysis, the evaluation of vehicle structures in all types of planar and rollover crashes, and in the design and performance of vehicle components and systems.

Mr. Parker has over 45 years of automotive industry and consulting experience in the design, development, testing, and analysis of domestic and foreign automotive products and components, and investigation and reconstruction of vehicular collisions, including fraudulent or staged collisions. His experience gives him extensive cumulative expertise, including the design, performance, testing, and manufacturing of vehicle body systems and components, energy absorbing frame elements, bumpers, roofs, closures (doors systems, hoods, trunk lids, folding tops), seats, trim and sealing systems. Over the course of his career, Mr. Parker has conducted and/or witnessed and analyzed the results from more than 200 full-scale vehicle crash tests in new product development, FMVSS and foreign certification, accident reconstruction validation, and research. He has also conducted numerous developmental and FMVSS certification tests on component-level items such as roofs, door beams and structures, door latches, door hinges, seat belt anchorages, and bumper systems.

Mr. Parker has provided consulting services in many diverse areas, including product design and validation, design defect claims, rollover/roof crush analysis, collision analysis and reconstruction, identifying vehicular insurance fraud, appropriate repair of damaged automobile bodies, product components such as gas springs, automotive seats, glass sealing and retention systems, door window regulators, door latches/locks, door and decklid/hatch closing systems, heavy truck ingress/egress systems, tow truck operational design, intellectual property validity/infringement issues, vehicle lighting, and organizational management. Mr. Parker's research further extends to assessing the use of alternate materials such as high strength steels, aluminum, composites and structural foams in vehicle structures, practical applications of glazing materials, integration of lithium-ion batteries in vehicle crash architecture, safety and handling of lithium-ion batteries in vehicle development facilities, and in analyzing the engineering design of various other consumer products.

Academic Credentials & Professional Honors

M.S., Mechanical Engineering, Oakland University, 1980

B.S., Mechanical Engineering, Automotive, General Motors Institute, 1975

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Accident Reconstruction, Northwestern University Traffic Institute (NWTI)

Tau Beta Pi Engineering Honorary Society

Recipient of 2008 Kettering/GMI Alumni Association Award for Engineering Achievement

Recipient of 2012 SAE Arch T. Colwell Award for outstanding paper (2010-01-0515) presented at SAE

Recipient of 2015 SAE Forest R. McFarland Award for outstanding contributions to the work of SAE

Licenses and Certifications

PADI Advanced Open Water Scuba Certification

PADI Certified Open Water Scuba Diver

Prior Experience

Director of Design and Development; CTS CarTopSystems of North America

Chief Engineer, Pininfarina of North America

Director of Structural Engineering, Ital Design of North America

Engineering Group Manager, General Motors Corporation

Professional Affiliations

Society of Automotive Engineers (member)

SAE Membership Grading Committee (past)

SAE Body Engineering/Occupant Protection Committee

- Rollover and Rear Impact Session; session organizer and peer reviewer (past)
- Structural Crashworthiness Session; session organizer and peer reviewer (past)
- Design Optimization, Methods, and Applications Session; session organizer and peer reviewer (past)

SAE Battery Safety Committee (current)

SAE Active Safety Systems Symposium; symposium co-organizer (current)

Publications

Parker D, Carpenter M. The Event Data Recorder – What Is It and How Can It Help Me? Michigan Defense Quarterly 2024; 40(3)

Parker D. The Event Data Recorder - A powerful tool in collision analysis. Michigan Defense Quarterly 2016; 32(4).

Parker D, Zolock J, Keefer R. A study of vehicle impacts during dolly rollover tests and comparison to frontal and side impact tests. SAE Technical Paper 2014-01-0529, 2014.

Reihle J, Steinmaier K, Hahn E, Parker D. Cord-reinforced composite exhaust hangers for optimizing NVH, durability and positioning in automotive applications. SAE Technical Paper 2012-01-0803, 2012.

Parker D. David versus Goliath revisited. What happens when small cars meet big cars on the road? Claims Journal 2012; 1(1).

Parker D, Mikolajczak C, Lange R. Considerations regarding hybrid and electric vehicle safety. ESV Technical Paper 11-0117, June 2011.

Parker D, Mikolajczak C. Lithium ion batteries—More different than they seem. Michigan Defense Trial Counsel (MDTC) e-letter, Issue No. 6, May 2011.

Pearce H, Parker D. Lug nut trace analysis to determine velocity ratio in sideswipe collisions. SAE Technical Paper 2011-01-0282, 2011.

Croteau J, Zolock J, Larson R, Bare C, Peterson D, Parker D. Dynamic response of vehicle roof structure and ATD neck loading in dolly rollover tests. SAE Technical Paper 2010-01-0515, 2010.

Parker D, Ray R, Moore T, Keefer R. Rollover severity and occupant protection—A review of NASS/CDS data. SAE Technical Paper 2007-01-0676, 2007.

Project Experience

Prior Experience

During industry career, was responsible for product design program and engineering team management and for design, analysis, and testing of many component and vehicle systems in numerous automotive products, including: overall body stiffness, vibrations and energy absorption; energy-absorbing crash structures; roof structure; bumpers; door beams; door latches and reinforcements; window regulators; liftgates; decklids; door, hatch and roof glass; structural foam reinforcements; folding convertible tops; folding hardtops; sealing systems, seats, seat belt mountings; interior and exterior trim; alternative materials such as aluminum and plastic composites; and more.

Consulting Experience

Assembled, organized, and led an engineering and design team in the development of folding roof systems, including mechanical, electrical, and hydraulic mechanisms, rollover protection, and weather sealing for production automobiles.

Collision reconstruction. Analyzed and reconstructed numerous accidents involving pedestrians, bicycles, motorcycles, automobiles, light trucks and SUVs, buses, heavy trucks, flat bed ("rollback") tow trucks and more.

Vehicular crashworthiness and structural system performance, including roof structure, front/side/rear impact, and more.

Analysis of vehicular collisions for insurance fraud, including staged or improvised collisions, enhanced damage, completeness of repairs and more.

Road vehicle crashworthiness and structural design analysis, including roof strength, door design, liftgate design, interior trim design, convertible vehicle design, and more.

Function, application, and performance of gas-charged support springs in various automotive and non-automotive product designs.

Automotive body design and manufacturing.

Vehicle program design, development and validation processes, including prototype phases

The suitability of repair processes and the parts used automobile repairs.

Intellectual property validity and infringement issues, including the design of automotive convertible folding tops, automotive seats, sliding window mechanisms, vehicle architecture, occupant protective structures, and more.

Vehicle concept and packaging design.

Automotive seat design.

Sealing and water management system design and performance.

Automotive door lock design and performance.

Automotive door performance in side impacts.

Automotive door, decklid and hatch/liftgate closing and/or latching convenience features and performance.

Field failures of powered automotive window regulators.

Vehicle lighting modifications.

Vehicle homologation to Federal requirements.

Pneumatic bus door operation.

Heavy truck cab egress system design.

Manufacturing defect analysis.

Glazing system retention and sealing.

Safe storage and handling of large-format lithium-ion batteries in vehicle assembly and test facilities.

Off-road tracked vehicle stability and rollovers.

Engine lubrication failure modes.

Reinforced fabric liquid storage tank failures and repairs.

In-vehicle animal cage crashworthiness issues.

Conversion van crash worthiness issues.

Pickup truck tonneau cover retention.

Flatbed tow truck operator safety and crashworthiness.

Moped/scooter/motorcycle identification and classification as relates to state and local statutes.

Additional Education & Training

Accident Reconstruction - Northwest University Traffic Institute